FURUNO

CHART RADAR

Models:

FAR-30x5 series

www.furuno.com

FURUNO FAR-30x5 Series Chart Radar offers reliable situational awareness and navigation safety through greatly enhanced target detection

X Band Antenna (Solid-State)
XN12CF . XN20CF . XN24CF

S Band(Magnetron/Solid-State)
SN36CF

X Band Antenna (Magnetron)
XN12AF . XN20AF . XN24AF

▶Newly designed antenna scanners to suppress the aerodynamic drag and prevent a spike in temperature

▶Less maintenance required through use of the DC brushless motor

▶Ethernet network link between antenna unit and below deck processor unit

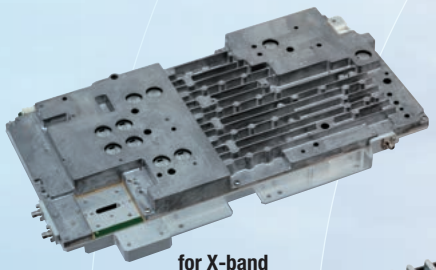
The analog signals are converted into the digital signals within the antenna unit and sent to the below deck processor unit via Ethernet network. This network technology eliminates loss of signal gain between antenna unit and processor unit that may be seen in conventional Radar system.

▶Optional LAN Signal Converter enables users to extend the cable between antenna unit and processor unit or to utilize the existing cables when retrofitting

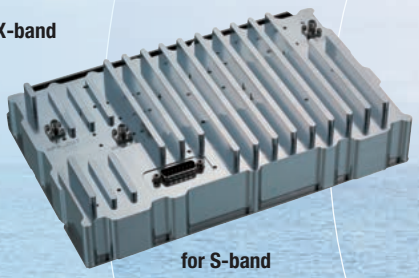
Solid State Radar model - NXT - specializes in target detection and maintainability

Compared to the traditional Magnetron Radar, the Solid State Radar NXT Series provide highly reliable target detection while requiring low power.

Power Amplifier Module of the Solid State transceiver



for X-band



for S-band

▶Clear images

Furuno Solid State Radar technology generates clear echo images, which allows users to obtain a clear picture of the area around their vessel, including weaker echoes from small crafts.

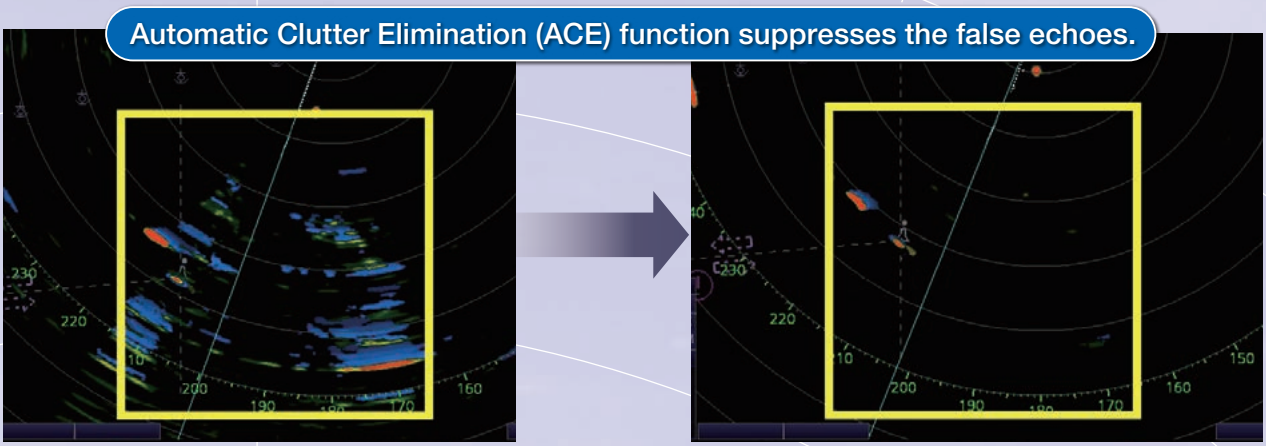
▶Reducing the time and cost for maintenance

- No need to replace the magnetron
- Removal of the consumable parts thanks to a fan-less antenna (S-band only)

▶Automatic Clutter Elimination (ACE) function provides clear echoes

Users can quickly adjust the radar image with a single action. When Automatic Clutter Elimination (ACE) function is activated, the system automatically adjusts the clutter reduction filter and gain control according to the sea and weather conditions selected (Calm/Rough Sea/Hard Rain).
Our advanced echo averaging architecture is also incorporated into Automatic Clutter Elimination (ACE) function. Users can avoid complicated adjustment processes, resulting in clear echo images.

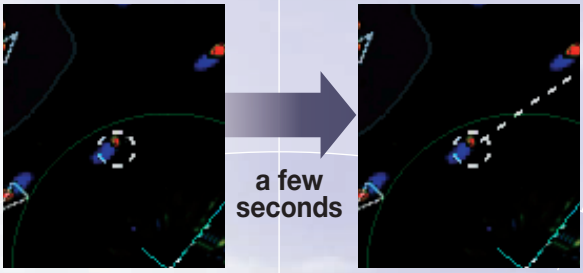
Automatic Clutter Elimination (ACE) function suppresses the false echoes.



ACE：OFF　　ACE：ON

▶Improved Target Tracking (TT) function

- **Target acquisition takes only a few seconds**



- **Acquired target does not jump to adjacent target**
- **Reliable and stable tracking of high-speed and rapidly maneuvering vessels**

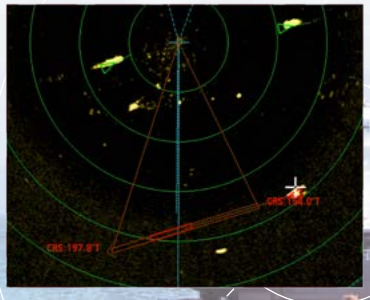
▶High performance Radar with Cat.1 and Cat.2 support

▶Complies with the following regulations:

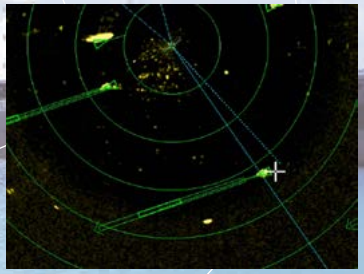
- IEC 60945 Ed. 4.0
- IEC 61162-1 Ed. 5.0
- IEC 61162-2 Ed. 1.0
- IEC 61162-450 Ed. 2.0
- IEC 61174 Ed. 4.0
- IEC 62288 Ed. 3.0
- IEC 62388 Ed. 2.0
- IEC 62923-1
- IEC 62923-2

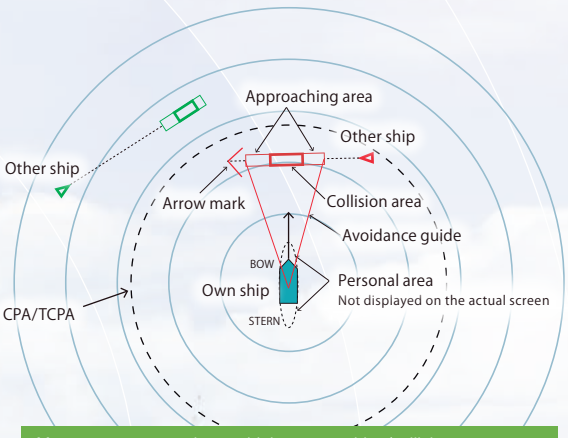
▶ See potential collisions with Risk Visualizer™

Risk Visualizer™ assists operators in making avoidance decisions by visualizing the areas where there is a risk of collision if own ship keeps current speed and other ship(s) continue to navigate at their current speed and course.
Risk Visualizer™ makes it easier to identify the risk of approaching or colliding with other vessels in challenging environments—such as during nighttime navigation, low-visibility conditions, high-traffic areas, or when the operator is managing a high workload.



In the example image, by altering course so that your ship does not enter the approaching area, you can avoid the other ship by maintaining a distance equal to the personal area.





Maneuver your vessel to avoid the approaching/collision areas, you will be able to avoid other ships. If your ship's course is within an approaching area, there is a risk of coming close to other ship, so the operators must steer with caution.

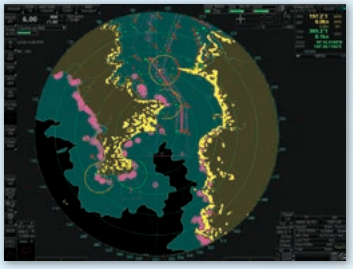
If target's CPA and TCPA are less than the threshold, the approaching /collision area will flash in red and the CPA/TCPA alert occurs. After acknowledging the alert, the flashing stops.

※If a target's speed or course is changed after your vessel changes its course, the risk of collision may increase. Maneuver your vessel accordingly to avoid collision.
※When the vector mode is set to the ground stabilization or sea stabilization(true), the approaching/collision area is shown with a thick solid line in the same direction as the vector of the target that is on a collision course with own ship.
※The color for the approaching/collision areas change according to the color of the target symbol.

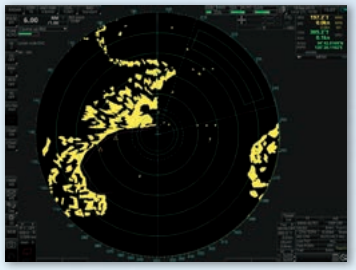
Multi Function Display (MFD) capability*

Furuno proposes workstations that combine flexibility and redundancy. Users may easily select ECDIS, Chart Radar, Conning display or Alert Management System at any multi-function display. Navigators will enjoy reduced workload and significant freedom to move about the bridge. All necessary information is available on a variety of displays and at locations that may be altered as required.

*MFD capability is to be implemented as software upgrade



Radar (Chart ON)



Radar (Chart OFF)

ECDIS

Conning Information Display

Sensor Adapter

▶Common sensor adaptor makes installation and maintenance easy

The Sensor Adapter acts as a central medium to gather all of the sensor data and collectively feed it to all FAR-30x5 Chart Radar and FMD-3200/3300 ECDIS in the network. Since the sensor adapter can be extended to interface with all the sensors within the network, individual cable connections in the sensor-to-Chart Radar/ECDIS interface can be greatly reduced.

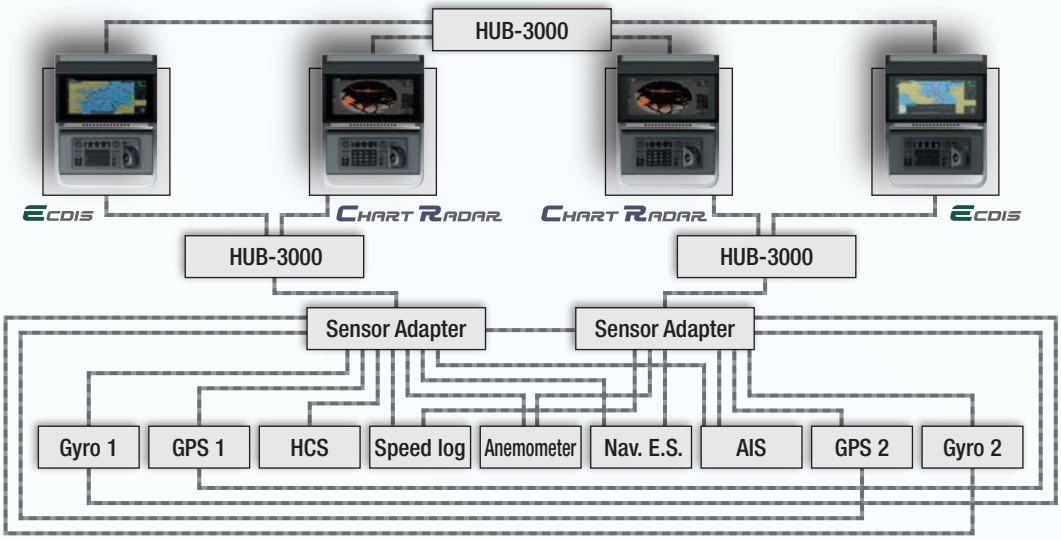
Navigation sensors can be directly interfaced with the processor's 8 serial I/O ports. Sensor adapters are required under the following conditions:

- The sensor data is to be shared amongst multiple networked Chart Radar and ECDIS systems,
- The number of sensors interfaced is more than the number of the ports the processor has (8 serial I/O ports, 1 digital IN and 6 digital OUT), and/or
- The networked sensors include analog sensors.

In order to integrate onboard sensors into the navigation network, the sensor adapter may be interfaced with the Intelligent Hub HUB-3000 from which distribution of the sensor data throughout the network is possible. Alternatively, multiple sensor adapters may be interfaced via Ethernet to integrate onboard sensors for use in the shipboard network.

System diagram for the new Chart Radar

Model: FAR-30x5



FURUNO's new user interface delivers straightforward operation

Unique & smart operation tool – "Status bar" and "InstantAccess bar™"

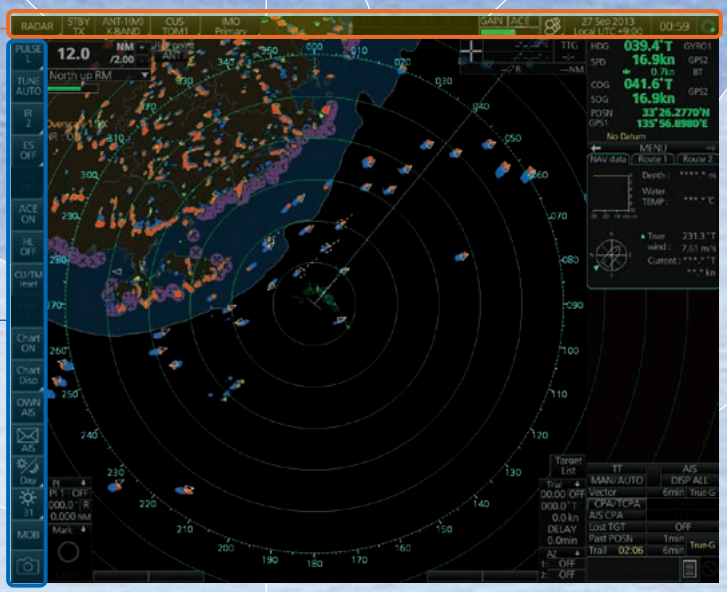
The user interface of the Radar utilizes carefully organized operational tools: the Status bar and the InstantAccess bar™. These operational tools deliver straightforward, task-based operation by which the operator can quickly perform tasks without having to navigate an intricate menu tree.

Status bar

Status bar contains information about the operating status, i.e., MFD operating mode, main tasks assigned to each MFD operating mode.

InstantAccess bar™

InstantAccess bar™ contains all the tasks (functions or actions) corresponding to the operation mode currently selected so that quick access to necessary functions/actions can be made.



Stress-free operation with the well-designed control unit

Intuitive operation

All operations can be controlled with the trackball.

Contextual menu

The context menu contains all the available actions related to the selected icon or area, it provides quick access to tasks.

Advanced technologies for safer andoptimal navigation in all kinds of situations (option)

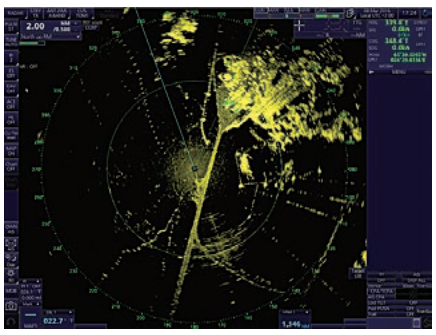
Wave Analyzer Software *

- Allows real-time monitoring and analysis of wave echoes
- Ensures safety at sea even at night

*More details on the Wave Analyzer brochure

Ice Mode ** (X-band magnetron only)

- Find the best route through ice
- Obeserve ice conditions by Radar



**Please contact your local distributor for more details

SPECIFICATIONS

PRODUCT NAME

MARINE RADAR

GENERAL

Range Scales and Ring Intervals

Range (NM)	0.125	0.25	0.5	0.75	1.5	3	6	12	24	48	96
RI (NM)	0.025	0.05	0.1	0.25	0.25	0.5	1	2	4	8	16
Number of rings	5	5	5	3	6	6	6	6	6	6	6

ANTENNA UNIT

Radiator Type — Slotted waveguide array

Beamwidth and Sidelobe

Antenna Type	X band						S band
	XN12CF	XN20CF	XN24CF	XN12AF	XN20AF	XN24AF	SN36CF
Antenna Length (cm/ft)	126 / 4.1	211 / 6.9	261 / 8.6	126 / 4.1	211 / 6.9	261 / 8.6	383 / 12.6
Horizontal beam	1.9°	1.23°	0.95°	1.9°	1.23°	0.95°	1.8°
Vertical beam	20°						25°
Side lobe (±10° or below)	-24 dB	-28 dB	-28 dB	-24 dB	-28 dB	-28 dB	-24 dB
Side lobe(±10° or above)	-30 dB	-32 dB	-32 dB	-30 dB	-32 dB	-32 dB	-30 dB

TRANSCEIVER UNIT

● Frequency and radio wave type

X band (Magnetron)	9410 MHz±30 MHz, P0N
S band (Magnetron)	3050 MHz±30 MHz, P0N
X band (Solid-state)	CH1 P0N: 9403.75 MHz/Q0N: 9423.75 MHz±5 MHz CH2 P0N: 9413.75 MHz/Q0N: 9433.75 MHz±5 MHz
S band (Solid-state)	CH1 P0N: 3043.75 MHz/Q0N: 3063.75 MHz±5 MHz CH2 P0N: 3053.75 MHz/Q0N: 3073.75 MHz±5 MHz

●Peak Output

FAR-3015	12 kW
FAR-3025	25 kW
FAR-3025-NXT	600 W
FAR-3035S	30 kW
FAR-3035S-NXT	250 W

Range scale, Pulse Repetition Rate and Pulselength

Magnetron radar: FAR-3015/3025/3035S

PRR (Hz approx.)	Range scale (NM)										
	0.125	0.25	0.5	0.75	1.5	3	6	12	24	48	96
3000	S1										
3000			S2								
1500				M1							
1200					M2						
1000						M3					
600*							L				

*: 500 Hz on 96 NM range.

Solid state radar: FAR-3025-NXT

PRR (Hz approx.)	Range scale (NM)										
	0.125	0.25	0.5	0.75	1.5	3	6	12	24	48	96
1500	S1										
1500			S2								
1200				M1							
1000					M2						
1000						M3					
600							L				

Solid state radar: FAR-3035S-NXT

PRR (Hz approx.)	Range scale (NM)										
	0.125	0.25	0.5	0.75	1.5	3	6	12	24	48	96
2400	S1										
2000			S2								
1500				M1							
1060					M2						
1000						M3					
600							L				

PROCESSOR UNIT

Chart Materials	IMO/IHO S57 edition-3 ENC vectorized material (IHO S-63 ENC data protection scheme), C-MAP and CM-93/3 vectorized materials
Data Presentation	
Own Ship	Own ship's mark and numeral position in lat/lon, speed and course
Target Data(TT: ARPA, AIS)	Range, bearing, speed, course, CPA/TCPA, BCR/BCT Target information from AIS (waypoint, ship's hull and status)
Position Calculation	Navigation by result from external position sensor Dead reckoning with gyro and log data from gyro, log, and position sensors to be fed to mathmatical filter to generate highly accurate position and speed
Navigation Planning	Planning by rhumb line, great circle
Route Monitoring	Off-track display, waypoint arrival alarm, shallow depth alarm
User Chart	User chart creation and display
Notes Data	Create and display notes data
MOB (Man Overboard)	Position, and other data at time of man overboard are recorded MOB mark is displayed on the screen

DISPLAY UNIT

Screen type	MU-270W
Resolution	27-inch color LCD, 1920 x 1200 (WUXGA)
Brightness	400 cd/m^2 typical
Visible distance	1.02 m nominal
Effective diameter	349 mm

INTERFACE

Processor Unit

DVI	2 ports, DVI-D (Video signal from DVI-1 and DVI-2 is identical) 1 port, DVI-I Ver. 1.1 (RGB for VDR)
LAN	2 ports, Ethernet 1000 Base-T (for Interswitch and Sensor Adapter) 1 ports,Ethernet 100 Base-TX（for Radar Sensor）
USB	4 ports, USB 2.0 type-A
COM	2 ports, RS232C/RS-485 (for brilliance control)
Serial I/O	7 ports IEC61162-1/2 (4 ports), IEC61162-1 (3 ports)
Sentences	
Input	ABK, ACN (ACM), ALC, ALF, ALR, ARC, CUR, DBT, DDC, DPT, DTM, EVE,GGA, GLL, GNS, HBT, HCR, HDT, MTW, MWD, MWV, NRM, NRX, NSR, RMC, RRT, SRP, THS, VBW, VDM, VDO, VDR, VHW, VLW, VSD, VTG, ZDA
Output	ABM, ALC, ALF, ALR, ARC, BBM, DDC, EVE, HBT, OSD, RRT, RSD, RTE, SRP, TLB, TTD, TTM, VSD, WPL
Digital Input	1 port (for ACK signal input)
Alarm Output	6 ports 1 port for system fail, 1 port for power fail, 2 ports for normal close, and 2 ports for normal open

Sensor Adapter

Control and Serial Input

LAN	1 port, Ethernet 100 Base-TX
Serial	8 ports IEC 61162-1/2 (4 ports), IEC 61162-1 (4 ports)
Analog Input	3 ports/per unit, -10 to +10 V/0 to 10 V, 4 to 20 mA selectable
Digital Input	8 ports/per unit, normal close or open, selectable
Digital Output	8 ports/per unit, normal close or open, selectable

POWER SUPPLY

Power Supply Unit	100-230 VAC: 1 phase, 50-60 Hz
FAR-3015	PSU-014: 1.7-0.8 A / PSU-014: 2.5-1.2 A
FAR-3025	PSU-014: 1.8-0.8 A / PSU-014: 2.5-1.2 A
FAR-3025-NXT	PSU-014: 1.8-0.9 A / PSU-014: 2.5-1.2 A
FAR-3035S	PSU-014: 2.8-1.3 A / PSU-015: 5.1-2.3 A
FAR-3035S-NXT	PSU-016: 2.3-1.1 A / PSU-018: 4.7-2.1 A
Processor Unit (EC-3005)	100-115/220-230 VAC: 2.3/1.1 A, 1 phase, 50-60 HZ
Display Unit	MU-270W：100-230 VAC:0.6-0.4 A, 1 phase, 50-60 Hz
Hub	100-230 VAC: 0.1 A, 1 phase, 50-60 Hz
De-icer (option)	100-115/220-230 VAC: 2.6-1.3 A, 1 phase, 50-60 Hz

ENVIRONMENTAL CONDITIONS

Unit	Ambient Temperature	Relative Humidity	Degree of protection	Vibration
Antenna Unit	-25°C to +55°C (storage +70°C)	95% or less at 40°C	IP56	IEC 60945 Ed. 4
Power Supply Unit	-15°C to +55°C		IP22	
Processor Unit			IP20	
Control Unit			IP22	
HUB-3000			IP22	

EQUIPMENT LIST

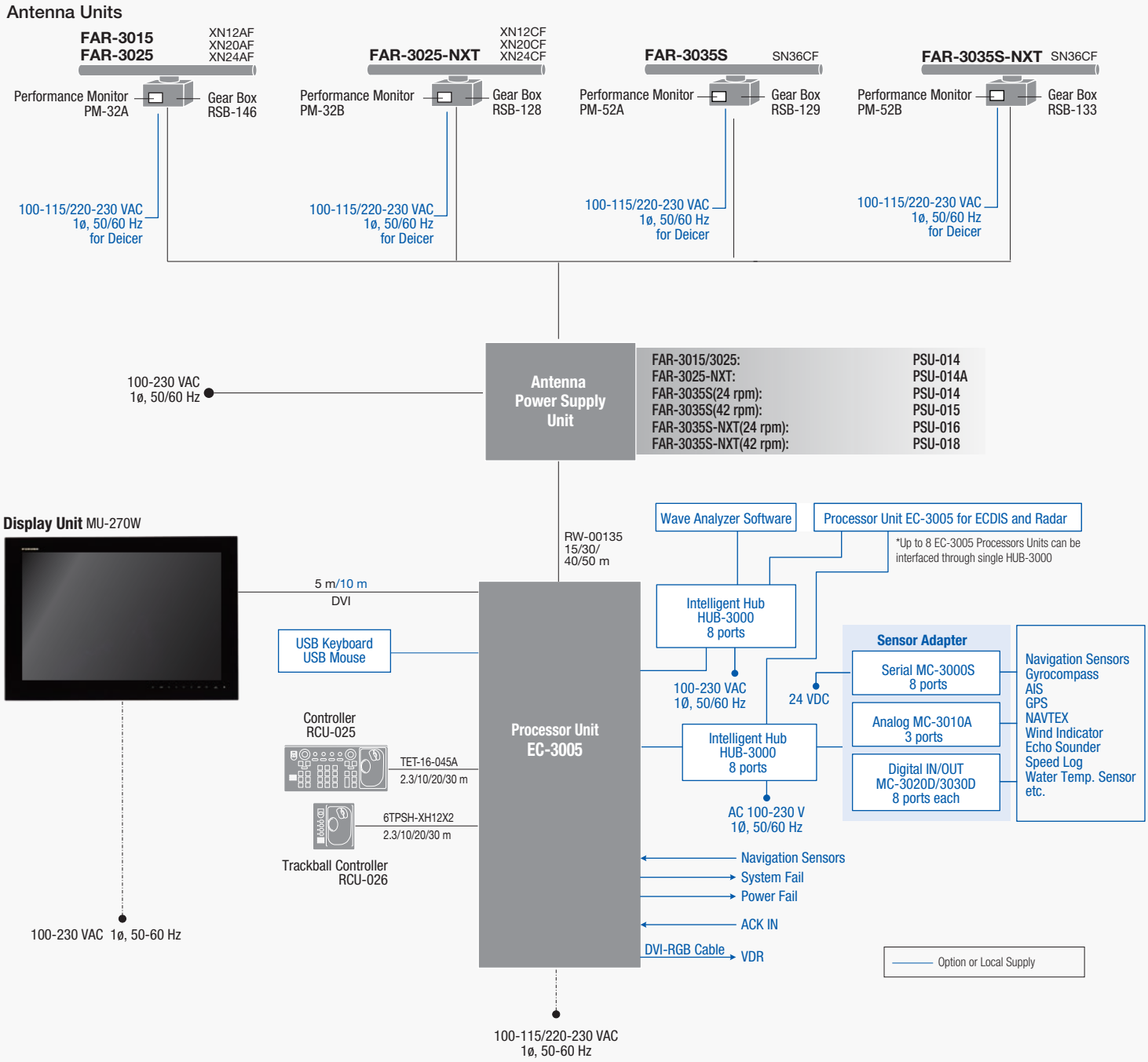
Standard

Display Unit	MU-270W	1 unit
Processor Unit	EC-3005	1 unit
Control Unit		1 unit
Radar Control Unit	RCU-025	1 unit (specify when ordering)
Trackball Control Unit	RCU-026	
Antenna Radiator	XN12CF/XN20CF/XN24CF XN12CA/XN20AF/XN24AF SN36CF	1 unit
Transceiver	RTR-107/111/123/131/132	1 unit
Gear Box	RSB-128/129/133/146	1 unit
Performance Monitor	PM-32A/32B/52A/52B	1 unit
Power Supply Unit	PSU-014/015/016/018	1 unit
Cable between Power Supply Unit and Antenna Unit		1 pc
LAN Cable between Processor Unit and Power Supply Unit		1 pc
Standard Spare Parts and Installation Materials		1 set

Option

Sensor Adapter	MC-3000S/3010A/3020D/3030D
Sub Display Radar Cable	RW-00136
De-icer	OP03-226/227/231/232/274
Junction Box (for foremast mounting)	RJB-001
Composite Cable between Junction Box and Antenna/ Power Supply Unit (for foremast mounting)	RW-9600
LAN Signal Converter (for foremast mounting)	OP03-223
Intelligent Hub	HUB-3000
Wave Analyzer Software	WV-100/WV-100ST

INTERCONNECTION DIAGRAM



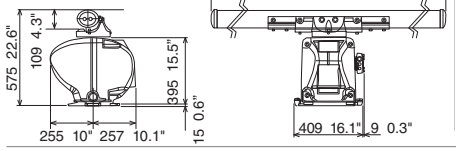
Model	Output Power	Transceiver	Antenna		Rotation	Power Supply	Display
FAR-3015 FAR-3025	X band 12 kW X band 25 kW	RTR-131 RTR-132	126 cm 204 cm 255 cm	(XN12AF) (XN20AF) (XN24AF)	24/42* rpm	PSU-014	27" WUXGA (MU-270W)
FAR-3025-NXT	X band 600 W	RTR-123	130 cm 210 cm 260 cm	(XN12CF) (XN20CF) (XN24CF)	24/42* rpm	PSU-014A	27" WUXGA (MU-270W)
FAR-3035S	S band 30 kW	RTR-107	383 cm	(SN36CF)	24/42* rpm	PSU-014 (24 rpm) PSU-015 (42 rpm)	27" WUXGA (MU-270W)
FAR-3035S-NXT	S band 250 W	RTR-111	383 cm	(SN36CF)	24/42* rpm	PSU-016 (24 rpm) PSU-018 (42 rpm)	27" WUXGA (MU-270W)

* Except for XN24CF

Antenna Unit (FAR-3025-NXT)

XN12CF 49 kg 108 lb
XN20CF 51 kg 112 lb
XN24CF 52 kg 115 lb

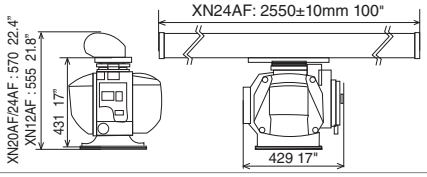
XN12CF: 1300±10mm 51.1"
XN20CF: 2100±10mm 82.6"
XN24CF: 2600±10mm 102.3"



Antenna Unit (FAR-3015/3025)

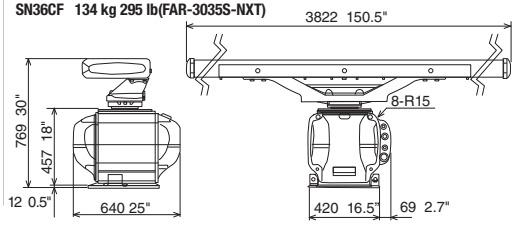
XN12AF 38 kg 84 lb
XN20AF 44 kg 97 lb
XN24AF 46 kg 101 lb

XN12AF: 1260±10mm 49.6"
XN20AF: 2040±10mm 80"
XN24AF: 2550±10mm 100"



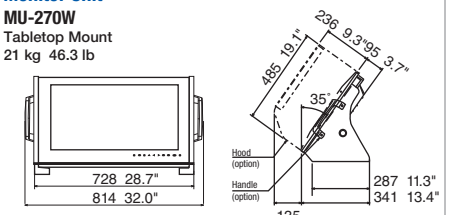
Antenna Unit (FAR-3035S/3035S-NXT)

SN36CF 140 kg 309 lb(FAR-3035S)
SN36CF 134 kg 295 lb(FAR-3035S-NXT)

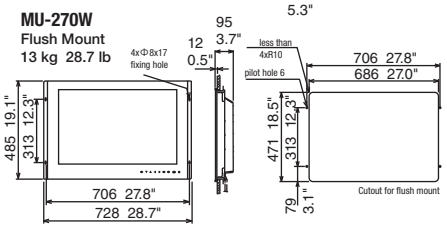


Monitor Unit

MU-270W
Tabletop Mount
21 kg 46.3 lb

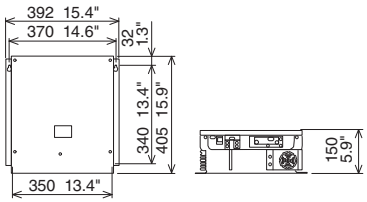


MU-270W
Flush Mount
13 kg 28.7 lb

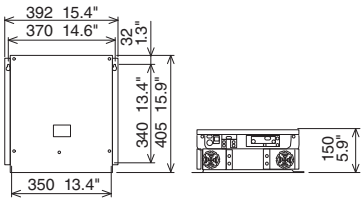


Power Supply Unit

PSU-014 8.5 kg 18.7 lb
PSU-016 8.5 kg 18.7 lb

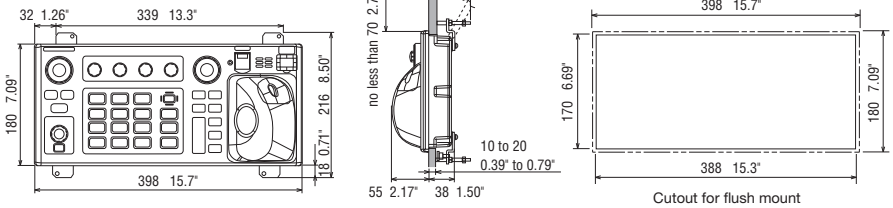


PSU-015 10 kg 22.0 lb
PSU-018 10 kg 22.0 lb



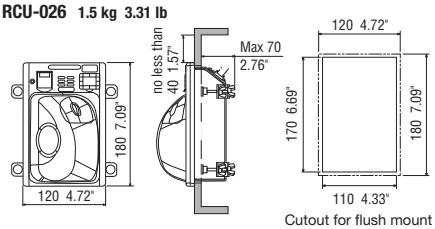
Control Unit

RCU-025 2.3 kg 4.4 lb



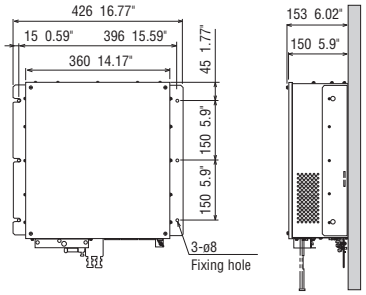
Trackball Control Unit

RCU-026 1.5 kg 3.31 lb



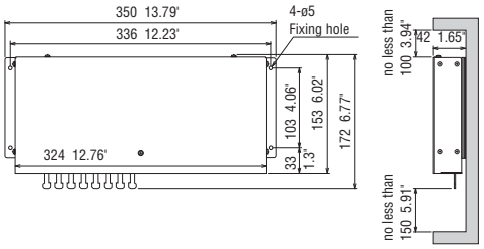
Processor Unit

EC-3005
14 kg 30.9 lb



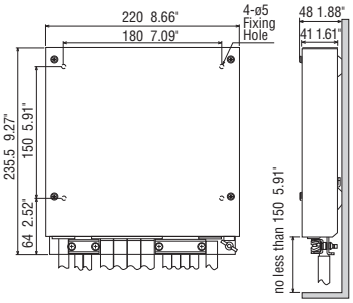
Intelligent Hub

HUB-3000
1.5 kg 3.31 lb

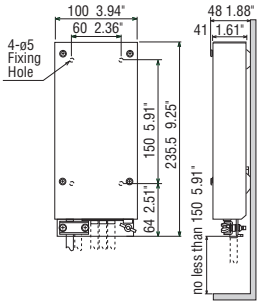


Sensor Adapter

Serial : MC-3000S 1.5 kg 3.3 lb



Analog : MC-3010A 0.8 kg 1.76 lb
Digital In : MC-3020D 0.8 kg 1.76 lb
Digital Out : MC-3030D 0.8 kg 1.76 lb



Beware of similar products

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

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